

What is claimed is:

1. A gas treatment device, comprising:
a catalyst substrate comprising a catalyst;
a shell concentrically disposed around said catalyst substrate;
a mat support material disposed between said catalyst substrate
5 and said shell, and concentrically around said catalyst substrate;
a retainer ring comprising a first wall and a second wall
connected by a bridge, said retainer ring concentrically disposed around said
catalyst substrate and in operable communication with said shell to form an
interference fit; and
10 said retainer ring contacts said mat support material.
2. The gas treatment device recited in Claim 1, wherein said
interference fit further comprises an outer surface of said shell in contact with
an inner surface of said second wall and said bridge.
3. The gas treatment device recited in Claim 1, wherein said
retainer ring further comprises a cross-sectional geometry selected from the
group consisting of semi-circular, semi-cylindrical, semi-oval, U-shaped, and
semi-non-circular.
4. The gas treatment device recited in Claim 1, wherein said
retainer ring further comprising at least two segments placed in operable
communication with said shell to form an interference fit, wherein said
interference fit further comprises an outer surface of said shell in contact with
5 an inner surface of said second wall and a bridge.
5. The gas treatment device recited in Claim 4, further
comprising an exhaust system component placed in operable communication
with said shell and said segments, and wherein said exhaust system component
is selected from the group consisting of an exhaust manifold, end cone,
5 connecting pipe, exhaust pipe, coupling apparatus, flexible coupling apparatus,
and combinations comprising at least one of the foregoing exhaust system
components.

6. The gas treatment device recited in Claim 5, wherein said segments are concentrically disposed along a major axis of said shell.

7. The gas treatment device recited in Claim 1, further comprising an exhaust system component placed in operable communication with said shell and said retainer ring, and wherein said exhaust system component is selected from the group consisting of an exhaust manifold, end
5 cone, connecting pipe, exhaust pipe, coupling apparatus, flexible coupling apparatus, and combinations comprising at least one of the foregoing exhaust system components.

8. The gas treatment device recited in Claim 7, wherein said exhaust system component is placed in operable communication with said shell by a device selected from the group consisting of one or more rivets, brackets, sealants, adherents, interlocking mechanisms, snaps, screws, joints, welds, and
5 combinations comprising at least one of the foregoing devices.

9. The gas treatment device recited in Claim 1, wherein said first wall penetrates said mat support material a sufficient distance to engage said mat support material.

10. The gas treatment device recited in Claim 1, wherein said bridge further comprises a plurality of apertures.

11. The gas treatment device recited in Claim 1, wherein said second wall further comprises an outwardly flared edge.

12. The gas treatment device recited in Claim 1, wherein said second wall includes a length that is about eighty percent of a length of said first wall.

13. The gas treatment device recited in Claim 1, wherein said bridge includes a width that is about ninety percent of a width of an annulus, wherein said annulus is measured from an outer surface of said catalyst substrate to an inner surface of said shell.

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14. A method of manufacturing a gas treatment device, comprising:

disposing a catalyst substrate comprising a catalyst concentrically within a shell;

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disposing said mat support material concentrically said catalyst substrate;

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disposing a retainer ring in operable communication with said shell to form an interference fit therewith, wherein said retainer ring comprises a first wall that contacts said mat support material, a second wall disposed on a side of said shell opposite said catalyst substrate, and a bridge connecting said first wall and said second wall;

forming an interference fit between said shell and said retainer ring; and

15

contacting said mat support material with said retainer ring.

15. The method recited in Claim 14, wherein said formation of said interference fit further comprises placing an outer surface of said shell in contact with an inner surface of said second wall, and an end of said shell in contact with said bridge.

16. The method recited in Claim 14, wherein said first wall penetrates said mat support material a sufficient distance to engage said mat support material.

17. The method recited in Claim 14, wherein said retainer ring further comprises at least two segments.

18. The method recited in Claim 17, wherein said first wall penetrates said mat support material a sufficient distance to engage said mat support material.

19 The method recited in Claim 17, wherein said formation of said interference fit further comprises placing an outer surface of said shell in contact with an inner surface of said second wall, and an end of said shell in contact with said bridge.

20. The method recited in Claim 17, further comprising disposing an exhaust system component in operable communication with said shell and said segments, and wherein said exhaust system component is selected from the group consisting of an exhaust manifold, end cone, connecting pipe,
5 exhaust pipe, coupling apparatus, flexible coupling apparatus, and combinations comprising at least one of the foregoing exhaust system components.

21. The method recited in Claim 20, further comprising securing said exhaust system component to said shell with a device selected from the group consisting of one or more rivets, brackets, sealants, adherents, interlocking mechanisms, snaps, screws, joints, welds, and combinations
5 comprising at least one of the foregoing devices.

22. The method recited in Claim 14, further comprising disposing an exhaust system component in operable communication with said shell and said retainer ring, and wherein said exhaust system component is selected from the group consisting of an exhaust manifold, end cone, connecting
5 pipe, exhaust pipe, coupling apparatus, flexible coupling apparatus, and combinations comprising at least one of the foregoing exhaust system components.

23. The method recited in Claim 22, further comprising securing said exhaust system component to said shell with a device selected from the group consisting of one or more rivets, brackets, sealants, adherents, interlocking mechanisms, snaps, screws, joints, welds, and combinations
5 comprising at least one of the foregoing devices.

24. A gas treatment device, comprising:
a catalyst substrate comprising a catalyst;
a shell concentrically disposed around said catalyst substrate;
a mat support material disposed between said catalyst substrate
5 and said shell, and concentrically around said catalyst substrate;
a retainer ring comprising a first wall and a second wall
connected therein by a bridge having a plurality of apertures, said retainer ring
concentrically disposed around said catalyst substrate, wherein an outer surface
of said shell is in contact with an inner surface of said second wall, an end of
10 said shell is in contact with said bridge, and said first wall contacts said mat
support material; and
an exhaust system component disposed in operable
communication with said shell and said retainer ring.

25. The gas treatment device recited in Claim 24, wherein said retainer ring further comprising at least two segments.

26. A gas treatment device, comprising:
means for catalytically treating gas comprising a shell
concentrically disposed about a catalyst substrate comprising a catalyst, and a
mat support material disposed between said shell and said catalyst substrate, and
5 around said catalyst substrate; and
means for reducing erosion of said mat support material
comprising a retainer ring comprising a first wall and a second wall connected
by a bridge, wherein said retainer ring is concentrically disposed around said
catalyst substrate, in contact with said mat support material, and in operable
10 communication with said shell to form an interference fit.

27. The gas treatment device recited in Claim 26, further comprising means for securing said shell to an exhaust system component comprising a device selected from the group consisting of one or more rivets, brackets, sealants, adherents, interlocking mechanisms, snaps, screws, joints, welds, and combinations comprising at least one of the foregoing devices, and wherein said exhaust system component is selected from the group consisting of an exhaust manifold, end cone, connecting pipe, exhaust pipe, coupling apparatus, flexible coupling apparatus, and combinations comprising at least one of the foregoing exhaust system components.
- 5